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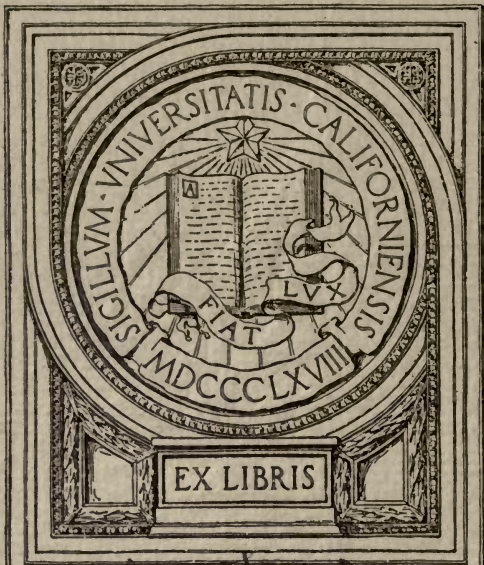
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H I L L
ON THE
CONSTRUCTIONAL WOODS OF
BRITISH GUIANA.

THE
CONSTRUCTIONAL WOODS OF
BRITISH GUIANA.

BY
LUKE MULLOCK HILL, B.E., M. INST. C.E.

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## SECT. II.—OTHER SELECTED PAPERS.

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(Paper No. 3302.)

### “The Constructional Woods of British Guiana.”

By LUKE MULLOCK HILL, B.E., M. Inst. C.E.

THE Colony of British Guiana, although comparatively little known to the British public specifically, has been long celebrated for its sugars, known in the trade as “Demerara crystals” (taking their name from the central county of the Colony, flanked on either side by the counties of Essequibo and Berbice, which formerly were separate colonies), and hardly less so for its hard woods, especially greenheart, which has been extensively employed in the construction of docks, wharves, and lock-gates both in Europe and in America.

Within the last 16 years gold has been discovered in large quantities in the hinterland, and has been worked successfully along the banks of the numerous rivers and creeks abounding in the interior; but the further development of the industry awaits the introduction of foreign capital and the opening up of the country by roads and railways. Diamonds in considerable numbers have also been discovered quite recently, and give promise of profitable working. Such opening up of lines of communication would also tend to the development of the timber trade of the colony, as vast forests of greenheart and other hard woods, bordering all the great rivers above their falls and navigable lower portions, are left practically untouched on account of the difficulties of transport. At the present time the Colony has only three short lines of railway, aggregating about 110 miles. Two of these run along the coast east and west of the Demerara River, where are situated most of the sugar plantations and other cultivated lands, cattle farms, etc. The other runs between the upper reaches of the Demerara and Essequibo Rivers, connecting the navigable portion of the Demerara River with the portion of the Essequibo River above the dangerous falls, which practically bar all further navigation in this river. This railway, although only a few years old, has already opened up large forests of fine old greenheart, mora, and wallaba timber lying in the space between the two rivers, and which were previously inaccessible.

The following is the usual mode of procedure in establishing and working a wood-cutting grant: The particular section of forest-land which it is proposed to work upon, having been located by a timber prospector, is surveyed by an officer of the Government Lands Department, and a licence of occupancy is granted to the timber merchant or wood-cutter interested in the venture. Labourers are engaged in town and registered at the Institute of Mines and Forests for 3 months' or 4 months' work in the interior. Then, with sufficient provisions to last out the term of engagement, they are conveyed, under charge of a manager or overseer, by steamer and boat to the location grant, where a camp is established, houses or bush benabs are erected, and a provision-shop is opened for the accommodation of the labourers, the cost of the goods supplied as extras to their ordinary rations being deducted from the labourer's account for wages on the termination of his engagement. The work of felling the trees and squaring the timber is then proceeded with, some of the men in the meantime being engaged in the construction of wood-paths leading from the actual site of the growing timber to the nearest creek or waterway (a distance, perhaps, of 1 mile or 2 miles), along which the squared timbers are hauled by direct manual labour, although on some of the larger wood-cutting grants draught oxen and mules are employed for this work, and on one extensive grant a light railway was worked for some years advantageously. These wood-paths are usually 6 feet to 15 feet in width, roughly levelled and "corduroyed" with round spars to act as rollers. They are carried across the smaller ravines by means of trestles and beams, but frequently on higher hillsides the timbers are simply precipitated to the bottom down a roughly improvised chute. To facilitate haulage the forward end of the timber, which is always the butt, is "sniped" or turned up in the form of a sleigh. In this a strong iron bolt is inserted, standing upright, to which a chain and hauling-ropes are attached. Some twenty men take hold of this chain by cross sticks, known as "grail sticks," fastened to it at intervals, and to the music of a hearty sing-song steadily march away with their load, very frequently for a considerable distance before reaching the waterside dépôt. There, if the creek is a small tributary one, the timbers, two or more pieces at a time, are attached to a small punt or "ballahoo" and floated out to the main creek or river, where they are loaded on to a larger punt known as a "sling-punt." This is usually a square-ended quarter-decked vessel measuring 25 feet by 12 feet, capable of carrying inside about 20 tons; but by taking advantage of the floatage of the timber in the water it is able to



convey about 80 tons of heavy timbers attached to the sides, supported on cross-beams suspended by means of strong slings made of bush-rope from two corresponding cross-beams lying across the deck above. Owing to the high specific gravity of greenheart and other hard woods it would be impossible to form floating rafts of the timber, as is done with the lighter woods of the northern hemisphere; but by suspending them in the water in the manner described, the actual weight borne by the punt or floating pontoon is only the difference between the weight of the timber and that of the water displaced by it. Over the main body of the punt is sometimes built an open house or Indian bush benab, in which the crew, frequently one or two aboriginal Indians with their families, swing their hammocks and live for some weeks whilst the punt with its suspended load of timber slowly drifts down the river to the timber-flats in Georgetown or New Amsterdam, or to a ship-loading station on one of the main rivers of the Colony, the Essequibo, Demerara, and Berbice being navigable for large sea-going vessels to a distance of about 100 miles from their mouths.

The following are the names and characteristic features of the principal woods of commercial importance grown in the Colony:—

**GREENHEART** (*Nectandra Rodiei*), *Specific Gravity 1.41*.—This wood is highly valued for all classes of submerged work, wharves, piles, dock- and lock-gates, etc. It is classed as one of the eight first-class woods at Lloyd's. In the colony it is largely used for bridge building, house frames, foundations, mill timbers, and many other purposes. It saws readily into planks and scantlings, planes well and easily, especially across the grain, and takes a good polish. The wood is found in all gradations of colour between green and black, and varies in weight between 62 lbs. and 75 lbs. per cubic foot, the oldest timber being the darkest and heaviest. It can be obtained in logs up to 70 feet in length and 1 foot 6 inches to 2 feet square.

**BULLET TREE** (*Mimusops Balata*), *Specific Gravity 1.084*.—A dark red and very close-grained wood of excellent and durable quality. Its uses are similar to those of greenheart. Owing to its toughness, it was a favourite wood for windmill-arms when those machines were more in use than at present. It saws easily and finishes smoothly, takes a fine polish with little trouble, and is an excellent wood for turning. From this tree is extracted the caoutchouc gum known as Balata, equal in quality to Para rubber. The bleeding process, however, affects the colour and texture of the wood until the tree has had time to recuperate. It can be obtained in logs up to 50 feet in length and 2 feet to 3 feet square.

**CRABWOOD** (*Carapa Guianensis*), *Specific Gravity* 0·656.—A brown wood much resembling mahogany, takes a fine polish, turns well, and makes most durable furniture. It is an excellent wood for flooring-boards, partitions, etc., in house building, and is also used for masts and spars. It is usually supplied in logs 30 feet to 50 feet in length and 1 foot to 1 foot 8 inches square.

**WALLABA** (*Eperna Falcata*), *Specific Gravity* 1·050.—A dark-red wood saturated with a red sticky resin, which renders the freshly-exposed surface sticky and gives the wood a characteristic smell when being sawn or adzed. It is extensively used for house frames, roof shingles, vat staves, posts and palings, and is most durable, standing exposure to all conditions, wet or dry, but above ground it is subject to attack from wood ants. It cleaves easily and straight, and staves and shingles are prepared in this way. It can be obtained in logs 40 feet to 60 feet in length and 1 foot to 1 foot 8 inches square.

**MORA** (*Dimorphandra Mora*), *Specific Gravity* 1·029.—The loftiest tree of the Colony, often attaining a height of nearly 200 feet. The wood is of a light-red colour, close-grained, exceedingly tough, difficult to split and saw, planes well and smoothly but slowly, and takes a good polish. It is used in shipbuilding, and ranks as one of the eight first-class woods at Lloyd's, being exceedingly durable and resisting dry rot. It makes excellent railway sleepers, and on account of its toughness it would probably prove a rival to jarrah and karri, the Australian red woods, for street paving. Bullet tree should also prove an excellent material for this purpose. In the Colony mora is largely used in boat-building, natural crooks or timbers being cut from the huge buttresses of the tree. It can be obtained in logs of over 100 feet in length and 1 foot 6 inches to 2 feet square.

**CIROUABALLI** (*Nectandra*), *Specific Gravity* 0·610 to 0·830.—There are two varieties of this wood known as "brown" and "yellow" silverballi or siruaballi. It is used for planking of boats and vessels, masts and booms, is insect-resisting, works easily, turns well, and takes a fine polish. It can be had in logs 60 feet to 80 feet in length and 1 foot 4 inches to 2 feet 6 inches square.

**SURADANNI** (*Meliaceae Cedrela*), *Specific Gravity* 0·846.—A dark deep-red-coloured wood with black streaks, works well, and takes a fine polish. It is used for making Indian dug-out canoes, planking boats, wheelwright work, furniture, etc., and is obtained in logs of 50 feet in length and 1 foot 2 inches to 1 foot 8 inches square.

**SIMARUPA** (*Picraena officinalis*), *Specific Gravity* 0·475.—This is a most useful wood for partitions and other inside house-work, as it



resists the attacks of wood ants and other insects, but it will not stand exposure to the weather. It is of a light yellow colour, saws easily, planes well and takes a fair polish. It is cheap and plentiful in the Colony, and can be had in logs up to 2 feet square. It might be more extensively used in place of the white pine lumber of the northern hemisphere.

CEDAR (*Icica altissima*), *Specific Gravity* 0·560.—A reddish-brown wood, most serviceable and valuable for cabinet-making and other uses. It can be had in long lengths and up to 2 feet square; but it is not so plentiful as the variety known as white cedar, which is very durable underground, for foundation timbers.

LIGNUM VITAE (*Guaicum officinale*), *Specific Gravity* 1·250.—True lignum vitae is not plentiful in British Guiana, and is often confounded with hackia (*Siderodendron triflorum*), which is equally hard, close-grained and heavy, and grows abundantly in the Colony. Both are used for the same purposes, such as cog-wheels, shafts, and foot-steps for vertical shafting in centrifugal pumps, etc., and both are practically indestructible.

LOCUST (*Hymenœa Courbaril*), *Specific Gravity* 0·942.—A streaked brownish wood, close-grained, saws readily in any direction, planes quickly and well and takes a fine polish. It is used for furniture, mill and engine beds, trenails, etc. The Indians make wood-skin canoes from the bark. This tree, which is abundant in some parts of the river forests, yields the gum animi of commerce, largely used in the manufacture of varnish. The gum is found buried in large quantities where a tree is rotted away, many barrels being often filled from one spot; it may also be procured in small quantities by tapping. Logs are obtained up to 1 foot 6 inches square.

KAKARALLI (*Lecythis ollaria*), *Specific Gravity* 1·010.—A light-brown-coloured wood, close-grained and tough, saws with difficulty, planes hard but well, turns satisfactorily, being firm and fine-grained, and polishes extremely well. It is a most valuable wood for submerged work, being even more durable than greenheart, and resisting the barnacle and teredo worms; it should be more extensively used for constructing wharves, dock-gates and sluices. Unfortunately it cannot be had in as large logs as greenheart timber, these rarely exceeding 40 feet in length and 10 inches to 1 foot 2 inches square.

PURPLE HEART (*Copaifera bracteata*), *Specific Gravity* 0·995.—This is one of the tallest forest trees of British Guiana. The wood is of a purple colour on all cut and exposed surfaces, hard, close-grained, durable, and very tough. It saws hard but cleanly,

planes fast and well, but is too hard for ordinary wood-turning tools, and takes a fine polish. It makes handsome furniture and is a splendid wood for house framing, engine and mill beds, etc., being capable of resisting great shocks. It would probably prove an excellent material for street paving, perhaps even better than bullet tree or mora, but it is not so plentiful as the latter. It can be obtained in long lengths 1 foot 6 inches to 2 feet 6 inches square. The bark of the purple heart is a favourite material in the construction of the Indian wood-skin canoes, some of which are of considerable size, accommodating fifteen or sixteen persons. The Indians also make "corials," or dug-out canoes, from this tree.

HOUBOBALLI (*Mimosa guianensis*), *Specific Gravity* 0.895.—The wood is of a light-brown colour, variegated with vertical veins of black and brown which are very effective; it is a wood of great beauty and makes handsome furniture. The tree grows plentifully in the Essequibo forest district. This wood is very durable under water, and on the bottom of a punt or boat will outlast any other. It saws easily and well, planes fairly fast, turns unusually well by hand, and takes an excellent polish, and is altogether a satisfactory material to deal with. It can be had in logs up to 50 feet in length and 1 foot 8 inches square.

For many of the foregoing particulars the Author is indebted to Mr. Michael McTurk, C.M.G., and Mr. Herbert Stone, F.L.S., the latter of whom recently conducted a series of technical tests of specimen logs of British Guiana timbers at the Imperial Institute. It may be added that there are numerous other useful and ornamental hard woods of British Guiana that might have been included; but the Author in making the foregoing selection sought to deal only with such timbers as might be considered of commercial importance and obtainable in quantity. A large collection of polished specimens of the woods of British Guiana is to be seen at the Imperial Institute.

The attention of railway and municipal engineers might be usefully directed to the suitability of the timbers of British Guiana for railway sleepers, wood paving and other engineering purposes, as they can be supplied from the Colony in large quantities and at reasonable prices.

The Paper was accompanied by a case of specimens of the timbers described, but space did not permit of its being retained at the Institution.





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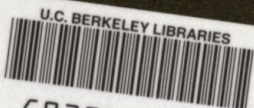
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